

# MODULE 6C

## CARRIER REQUIREMENTS - RAIL



6C-01-10/99

# **PART 174 - CARRIAGE BY RAIL**

**MUST ALSO COMPLY WITH**

- PART 171**
- PART 172**
- PART 173**
- PART 179**

# **ACCEPTANCE**

**Haz Mat Shipments  
must be in compliance  
with the HMR**

# **ACCEPTANCE**

**Railroad's haz mat must be  
in compliance  
Shipper Certification - not required**

# **ACCEPTANCE**

**HMR do not apply to:**

- Torpedoes**
- Fusees**



# INSPECTION



**Inspect rail car containing HM**

- At each location where HM is accepted or placed in train**
- For required markings, labels, placards, closures, leakage**

# **DISPOSITION OF SHIPMENTS**

**Must forward**

- Within 48 hours, or**
- On first available train**

# ADDITIONAL RESTRICTIONS



**May be imposed by rail carrier  
Must be reported to BOE for  
publication**



# BULK PACKAGING (TOFC/COFC)



**§ 174.63 Portable tanks, IM portable tanks, intermediate bulk containers, cargo tanks, and multi-unit tank car tanks.**

(a) A carrier may not transport a bulk packaging (e.g., portable tank, IM portable tank, intermediate bulk container, cargo tank, or multi-unit tank car tank) containing a hazardous material in container-on-flatcar (COFC) or trailer-on-flatcar (TOFC) service except as authorized by this section or unless approved for transportation by the Associate Administrator for Safety, FRA.

**Requirements in 174.63  
or  
Approval from FRA**

# **BULK PACKAGING**

**Inside fully closed transport vehicle, or  
In a freight container  
Must be secured**

# **APPROVAL BY FRA**

**HM in cargo tank or multi-unit  
tank car tank  
In TOFC/COFC service**

# HM SEGREGATION

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or Division	Notes	1.1, 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas Zone A	2.3 gas Zone B	3	4.1	4.2	4.3	5.1	5.2	6.1 liq- uids PG I Zone A	7	8 liquids only
Explosives .....	1.1 and 1.2 A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives .....	1.3	*	*	*	*	*	X		X	X	X		X	X	X	X	X		X
Explosives .....	1.4	*	*	*	*	*	O		O	O	O		O	X	X	X	O		O
Very insensitive explosives	1.5	A	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive ex- plosives.	1.6		*	*	*	*													
Flammable gases .....	2.1		X	X	O	X			X	O							O	O	
Non-toxic, non-flammable gases.	2.2		X		X														
Poisonous gas Zone A .....	2.3		X	X	O	X	X				X	X	X	X	X	X			X
Poisonous gas Zone B .....	2.3		X	X	O	X	O				O	O	O	O	O	O			O
Flammable liquids .....	3		X	X	O	X			X	O					O		X		
Flammable solids .....	4.1		X		X				X	O							X		O
Spontaneously combustible materials.	4.2		X	X	O	X			X	O							X		X
Dangerous when wet ma- terials.	4.3		X	X		X			X	O							X		O
Oxidizers .....	5.1	A	X	X		X			X	O	O						X		O
Organic peroxides .....	5.2		X	X		X			X	O							X		O
Poisonous liquids PG I Zone A.	6.1		X	X	O	X	O				X	X	X	X	X	X			X
Radioactive materials .....	7		X		X		O					O	X	O	O	O	X		
Corrosive liquids .....	8		X	X	O	X			X	O		O	X	O	O	O	X		



# HM SEGREGATION

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or Division		Notes	1.1, 1.2	1.3	1.4	1.5	1.6	2.1
Explosives .....	1.1 and 1.2	A	*	*	*	*	*	X
Explosives .....	1.3		*	*	*	*	*	X
Explosives .....	1.4		*	*	*	*	*	O
Very insensitive explosives	1.5	A	*	*	*	*	*	X
Extremely insensitive explosives.	1.6		*	*	*	*	*	
Flammable gases .....	2.1		X	X	O	X		
Non-toxic, non-flammable gases.	2.2		X			X		
Poisonous gas Zone A .....	2.3		X	X	O	X		X
Poisonous gas Zone B .....	2.3		X	X	O	X		
Flammable liquids .....	3		X	X	O	X		
Flammable solids .....	4.1		X			X		
Spontaneously combustible materials.	4.2		X	X	O	X		
Dangerous when wet materials.	4.3		X	X		X		

# HM SEGREGATION

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

Class or Division	Notes	1.1, 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas Zone A	2.3 gas Zone B	3
Explosives .....	1.1 and 1.2	A	*	*	*	*	X	X	X	X	X
Explosives .....	1.3		*	*	*	*	X		X	X	X
Explosives .....	1.4		*	*	*	*	O		O	O	O
Very insensitive explosives	1.5	A	*	*	*	*	X	X	X	X	X
Extremely insensitive explosives.	1.6		*	*	*	*					
Flammable gases .....	2.1		X	X	O	X			X	O	
Non-toxic, non-flammable gases.	2.2		X			X					
Poisonous gas Zone A .....	2.3		X	X	O	X	X				X
Poisonous gas Zone B .....	2.3		X	X	O	X	O				O
Flammable liquids .....	3		X	X	O	X			X	O	
Flammable solids .....	4.1		X			X			X	O	
Spontaneously combustible materials.	4.2		X	X	O	X			X	O	
Dangerous when wet materials.	4.3		X	X		X			X	O	
Other	5.1	A				X			X		O

# HM SEGREGATION



6C-15-10/99



# HM SEGREGATION

SEGREGATION TABLE FOR HAZARDOUS MATERIALS

1.1, 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas Zone A	2.3 gas Zone B	3
*	*	*	*	*	X	X	X	X	X
*	*	*	*	*	X				
*	*	*	*	*	O				
*	*	*	*	*	X	X			
*	*	*	*	*					
X	X	O	X						
X			X						
X	X	O	X		X				
X	X	O	X		O				
X	X	O	X						
X	X	O	X						





# UNLOADING HM



6C-17-10/99

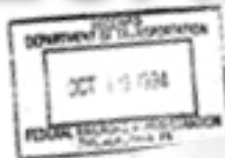


# UNLOADING HM



6C-18-10/99

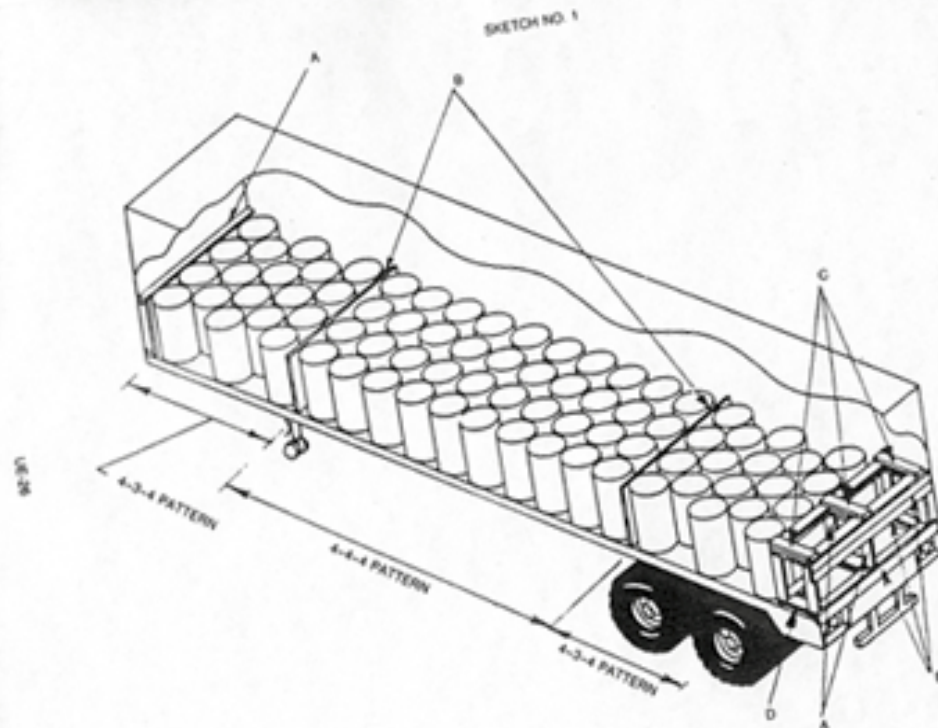
# LOADING OF HM



## Pamphlet 6-C

Approved Methods for Loading and Restraint  
Shipments of Hazardous Materials for  
Trailer/Container on Flat Car  
(TOFC - COFC)  
Movements  
Including less than Trailer/Container Load  
and Mixed Loads

Hazardous Materials Systems (BOE)  
Mechanical Division  
Association of American Railroads  
50 F Street, N.W.  
Washington, DC 20001  
Republished 1986  
Copyright 1985 ©





# LOADING OF HM

**This**



**Not This**





# LOADING OF HM



6C-21-10/99

# **LEAKAGE**

**Remove Leakage**

- in rail car,**
- and**
- on railroad property**

# LOADING CLASS 1 EXPLOSIVES

## Subpart E—Class I (Explosive) Materials

### § 174.101 Loading Class 1 (explosive) materials.

(a) Boxes containing Division 1.1 or 1.2 (Class A explosive) materials must be loaded so that the ends of wooden boxes will not bear against sides of any fiberboard boxes and so that the end of any box will not cause a pressure point on a small area of another box.

(b) Explosive bombs, unfuzed projectiles, rocket ammunition and rocket motors, Division 1.1, 1.2, or 1.3 (Class A or Class B explosive) materials, which





# **ACCEPTANCE**

**HM Shipments must be:**

- Classed**
- Described**
- Packaged**
- Marked**
- Labeled**

# DEFINITION

**Train** means one or more engines coupled with one or more rail cars, except...

# DEFINITION

**FRA:**

**"A train exists**

- when federal air brake rules apply to train movement, or**
- when picking up or setting out cars at interchanges or industry."**



# **REQUIRED DOCUMENTATION**

**Train Crew Must Carry:**

- Shipping papers**
- Document showing current position of rail car carrying HM**

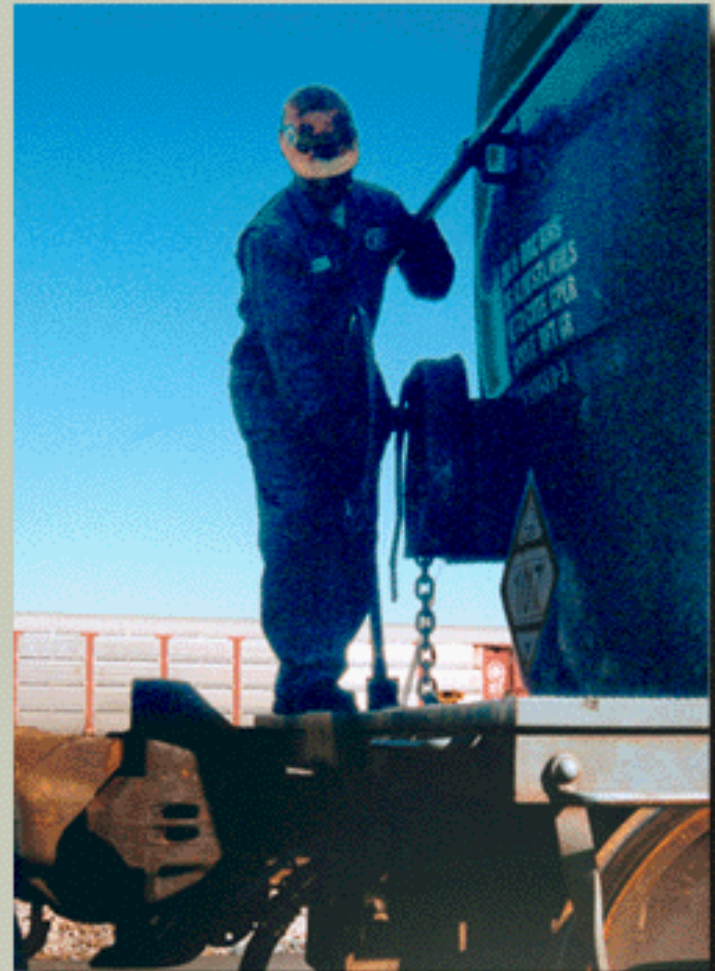
# MARKINGS and PLACARDS



6C-28-10/99



# SWITCHING



6C-29-10/99



# HANDLING RESTRICTIONS

**Div. 1.1**

**Div. 1.2**

**Div. 2.3, Zone A**

**Div. 6.1, Zone A**

**DOT 113 placarded 2.1**



# **HANDLING RESTRICTIONS**

## **DO NOT:**

- Cut off while in motion**
- Couple with more force than necessary**

# **HANDLING RESTRICTIONS**

**Do not cut off while in motion**

**Do not strike placarded cars**

**Do not couple with excessive force**



# **TRAIN PLACEMENT**

**Separate**

**Div. 1.1 and 1.2 from engine**

**By at least one non-placarded car**

# TRAIN PLACEMENT

## Strict rules of separation apply



6C-34-10/99

# TRAIN PLACEMENT

PLACARD GROUP 1	PLACARD GROUP 3	PLACARD GROUP 4
Div. 1.1 Div. 1.2	Div. 2.3 (PG I, Zone A)  Div. 6.1 (PG I, Zone A)	Class 7

# TRAIN PLACEMENT

## PLACARD GROUP 2

<b>Div. 1.3</b>	<b>Class 2</b>	<b>Class 5</b>
<b>Div. 1.4</b>	<b>Class 3</b>	<b>Class 6</b>
<b>Div. 1.5</b>	<b>Class 4</b>	<b>Class 8</b>



# TRAIN PLACEMENT

## POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
1. When train length permits, placarded car may not be nearer than the sixth car from the engine or occupied caboose.	X	X		X		
2. When train length does not permit, placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.	X	X		X		
3. A placarded car may not be placed next to an open-top car when any of the lading in the open top car protrudes beyond the car ends, or if the lading shifted, would protrude beyond the car ends..	X	X		X		
4. A placarded car may not be placed next to a loaded flat car, except closed TOFC/COFC equipment, auto carriers, and other specially equipped cars with tie-down devices for securing vehicles. Permanent bulk head flat cars are considered the same as open-top cars.	X	X		X		
5. A placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open-flame device in operation..	X	X		X		
6. Placarded cars may not be placed next to each other based on the following:						
Placard Group 1 .....		X	X	X	X	X
Placard Group 2 .....	X			X	X	X
Placard Group 3 .....	X	X	X			X
Placard Group 4 .....	X	X	X	X	X	

# TRAIN PLACEMENT

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
1. When train length permits, placarded car may not be nearer than the sixth car from the engine or occupied caboose.	X	X		X		
2. When train length does not permit, placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.	X	X		X		
3. A placarded car may not be placed next to an open-top car when any of the lading in the open top car protrudes beyond the car ends, or if the lading shifted, would protrude beyond the car ends..	X	X		X		
4. A placarded car may not be placed next to a loaded flat car, except closed TOFC/COFC equipment, auto carriers, and other specially equipped cars with tie-down devices for securing vehicles. Permanent bulk head flat cars are considered the same as open-top cars.	X	X		X		
5. A placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open-flame device in operation..	X	X		X		
6. Placarded cars may not be placed next to each other based on the following:						
Placard Group 1 .....		X	X	X	X	X
Placard Group 2 .....	X			X	X	X
Placard Group 3 .....	X	X	X			X
Placard Group 4 .....	X	X	X	X	X	

# TRAIN PLACEMENT

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
1. When train length permits, placarded car may not be nearer than the sixth car from the engine or occupied caboose.	X	X		X		
2. When train length does not permit, placarded car must be placed near the middle of the train, but not nearer than the second car from an engine or occupied caboose.	X	X		X		

# TRAIN PLACEMENT

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS—Continued

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
3. A placarded car may not be placed next to an open-top car when any of the lading in the open top car protrudes beyond the car ends, or if the lading shifted, would protrude beyond the car ends..	X	X		X		
4. A placarded car may not be placed next to a loaded flat car, except closed TOFC/COFC equipment, auto carriers, and other specially equipped cars with tie-down devices for securing vehicles. Permanent bulk head flat cars are considered the same as open-top cars.	X	X		X		
5. A placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open-flame device in operation..	X	X		X		



# TRAIN PLACEMENT



# TRAIN PLACEMENT

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS—Continued

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
5. A placarded car may not be placed next to any transport vehicle or freight container having an internal combustion engine or an open-flame device in operation..	X	X		X		

# TRAIN PLACEMENT

POSITION IN TRAIN OF PLACARDED CARS TRANSPORTING HAZARDOUS MATERIALS

RESTRICTIONS	Placard Group 1	Placard Group 2		Placard Group 3		Placard Group 4
	Rail Car	Tank Car	Rail Car	Tank Car	Rail Car	Rail Car
6. Placarded cars may not be placed next to each other based on the following:						
Placard Group 1 .....		X	X	X	X	X
Placard Group 2 .....	X			X	X	X
Placard Group 3 .....	X	X	X			X
Placard Group 4 .....	X	X	X	X	X	

# TRAIN PLACEMENT



6C-44-10/99



# TRAIN PLACEMENT



6C-45-10/99

# **TRAIN PLACEMENT**

**Place escorted cars  
(placarded Div. 1.1, 1.2, 2.3, 6.1)  
next to/ahead of car carrying  
escorts/guards**

# MAXIMUM SPEED



**15 MPH**  
**Molten metal**  
**Molten glass**

# **INDUSTRY RESTRICTIONS**

## **KEY TRAINS**

- Five tank car loads of PIH; or
- Twenty or more loaded cars, trailers, containers, IM tanks
  - Div. 2.3 and 6.1 (Zone A or B, PIH)
  - Div. 1.1 and 1.2
  - Div. 2.1
  - Environmentally sensitive chemicals



# **INDUSTRY RESTRICTIONS**

## **KEY TRAINS**

- Maximum speed - 50 mph**
- Inspections required**
  - Emergency stops**
  - Hot box detector stops (if alarm sounds)**

# **INDUSTRY RESTRICTIONS**

## **KEY ROUTES**

- 10,000 loads of HM per year
- More than 4,000 loads of
  - Div. 2.3 and Div. 6.1, Zone A and B, PIH
  - Div. 1.1 and 1.2
  - Div. 2.1
  - Environmentally sensitive chemicals

# **LEAKAGE**

**Packages, other than tank cars**

- Repair**
- Recondition**
- Place in Salvage Drum**

# **NONCONFORMING TANK CARS**

**Must be repaired, or  
Must be approved for movement**



# **LEAKAGE**

## **Leaking tank car**

- May be moved to safeguard human health and environment**
- Limit movement**

# INSPECTION



6C-54-10/99

# INSPECTION







6C-56-10/99





6C-57-10/99

# INCIDENTS / ACCIDENTS



**NRC 1-800-424-8802**



The background is a dark blue night sky. In the upper right corner, there is a large, bright crescent moon. Scattered across the sky are numerous white stars of varying sizes and brightness. Some stars have long, thin white trails, suggesting they are comets or meteors. The overall scene is a classic representation of a starry night.

# THE END